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ABSTRACT

The Federal Aviation Administration (FAA) has initiated the Airway Science curriculum as a method of preparing the next generation of aviation technicians and managers. This document: (1) discusses the FAA's role in the Airway Science program; (2) describes some of the career fields that FAA offers to Airway Science graduates (air traffic control specialist, computer specialist, electronics technician, and aviation safety inspector); (3) outlines the basic Airway Science curriculum; and (4) lists additional courses needed in five specialized fields. These fields (and the career or work area which individuals will be qualified for) include: science management (air traffic control specialist, air carrier manager, airport manager, general aviation operations manager); airway computer science (flight, navigation, communications, information processing); aircraft systems management (aviation safety inspector, professional pilot, flight operations manager); airway electronics systems (troubleshooting, maintenance, testing, development, electronics); and aviation maintenance management (maintenance, troubleshooting, aviation safety inspector). A list of colleges and universities participating in the Airway Science curriculum is provided. (JN)

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U.S. Department of Transportation
Federal Aviation Administration

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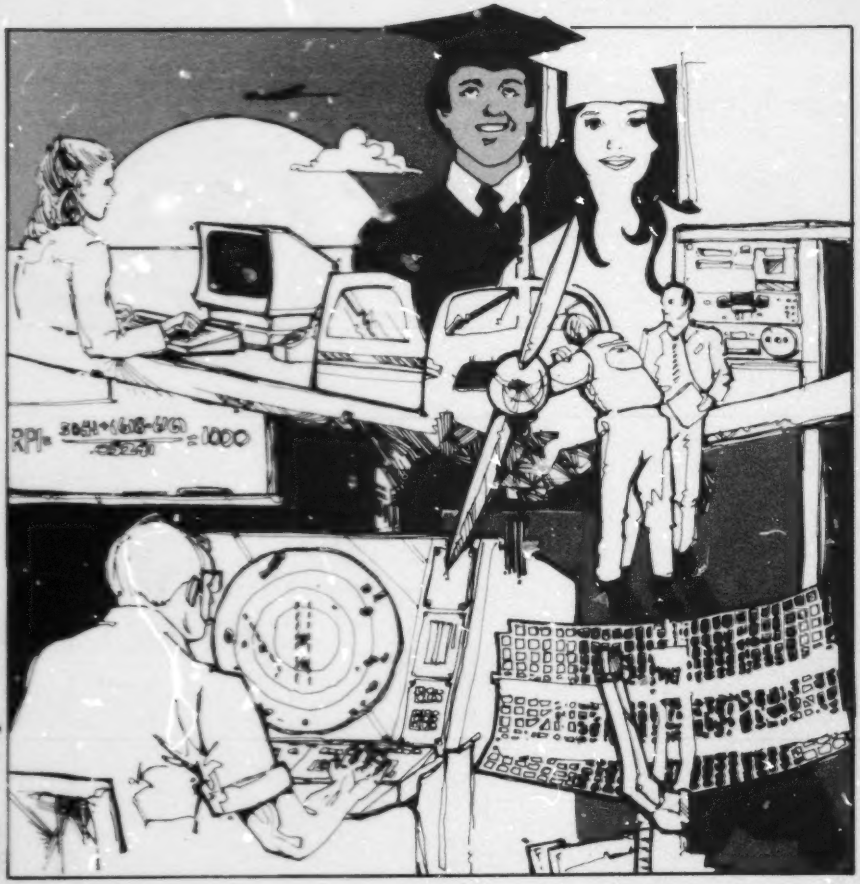
CAREERS IN AIRWAY SCIENCE



SE 049 722

"Today, we stand on the edge of a world in which opportunities are limited only by our own imagination. Our leadership in air and space technology, a leadership we're determined to maintain, has already provided the American people with a rich bounty that has strengthened our economy and bettered our lives."

President Ronald Reagan
February 7, 1983

First Edition, Second Printing
November 1983

INC 787

J. Lynn Helms
FAA Administrator

If you're interested in an exciting and rewarding career field, I can recommend the one to which I've been deeply committed for nearly 40 years: Aviation.

This is one field that encompasses many occupations . . . safety, flying, electronics, air traffic control, and computers.

It's definitely a high-tech environment, as our technology has exploded with the advent of such discoveries as low-cost silicon chips and microminiaturization.

As important as new technology is, we also recognize the value of our most important resource — people.

For this reason, we are recruiting people who appreciate human values and are aware of the value of human relations.

This, we believe, will emanate from the Airway Science Education Program with its blend of hard science, management, and specialty education.

Good education is vital to our effectiveness in the coming high-tech milieu, so come on board and join us in the Skies of Tomorrow!

J. Lynn Helms

AIRWAY SCIENCE. . . EDUCATION FOR THE FUTURE

Aviation is in the forefront of technological change — and progress. It is estimated that by the end of this century, the number of flights will *more than double*, the number of pilots will *increase by 60 percent*, and this country will have *800 new airports*.

The next twenty years promise to be exciting and challenging ones!

To meet the challenge and to prepare our work force to cope with the sociotechnological forces of the future, the Airway Science curriculum was developed.

Airway Science is a rigorous program to educate the future technical managers of the aviation industry. The curriculum stresses hard science, the human side of management, knowledge of computers and, of course, aviation.

While there are other, more traditional methods available to prepare one to enter into aviation occupations, the future of aviation demands a more comprehensive approach. Individuals in the aviation work force with an Airway Science education will have a broader perspective with a deeper commitment to aviation.

THE FEDERAL AVIATION ADMINISTRATION'S ROLE IN AIRWAY SCIENCE EDUCATION

The Federal Aviation Administration (FAA) needs a cadre of well-qualified men and women to support the National Airspace System of the future.

The capability of the people who will fill these posts is enormously important . . . indeed, the beneficiaries of a highly-qualified FAA work force are all those whose lives are affected by air transportation: the public at large.

One of aviation's most exciting — and ambitious — projects may be the FAA's goal to automate the skies of tomorrow. The FAA will spend $15 billion by the end of the century to modernize the air traffic control system and develop airborne aircraft avoidance systems.

New concepts for equipment and procedures, and new ways of solving problems require a new type of individual — one who can flourish in the technical environment — a person who can think, plan, organize, and manage — both machines and people.

The FAA has therefore initiated the Airway Science curriculum as a method of preparing the next generation of aviation technicians and managers.

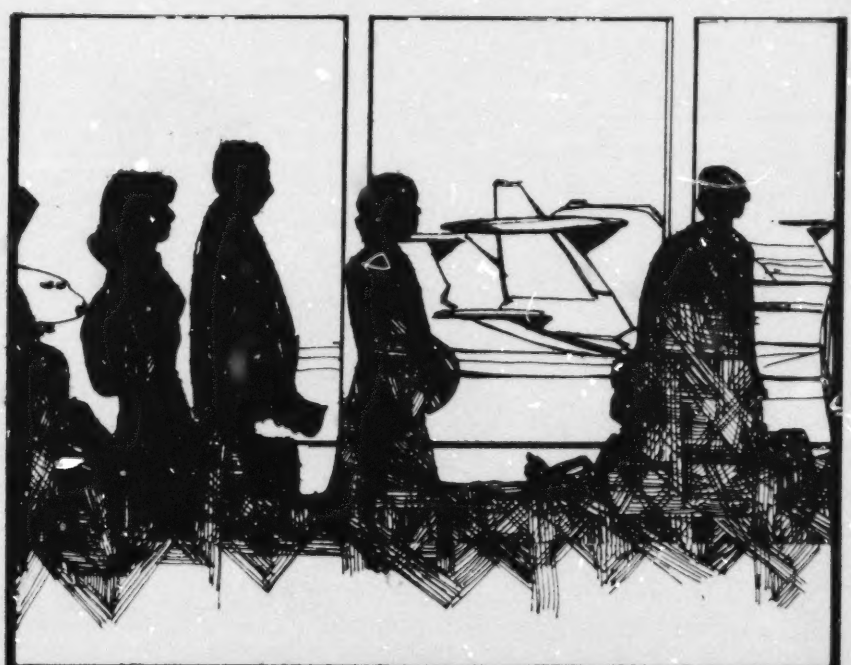
Many of the nation's institutions of higher learning have adopted the curriculum, which has been approved by the University Aviation Association.

For the next several years, the FAA will help to support Airway Science Education by hiring up to 500 qualified graduates each year.

If you are within a year of completing the Airway Science program and are interested in a career with the FAA, write for information to:

Federal Aviation Administration
Special Examining Division, AAC-80
Mike Monroney Aeronautical Center
Post Office Box 25082
Oklahoma City, OK 73125

Applications will also be accepted twice annually by the Office of Personnel Management Federal Job Information Centers in major cities throughout the country.



CAREERS WITH THE FEDERAL AVIATION ADMINISTRATION

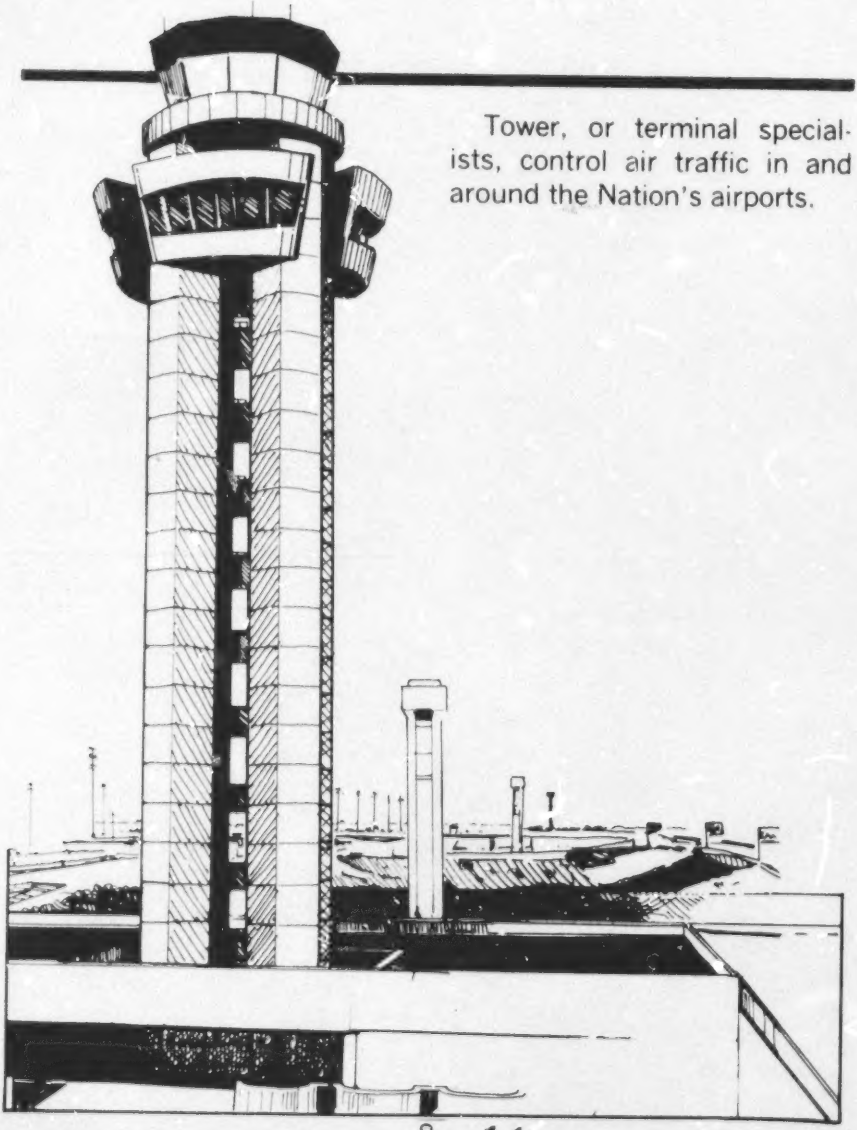
These are some of the career fields that the FAA offers to Airway Science graduates...

I. AIR TRAFFIC CONTROL SPECIALIST

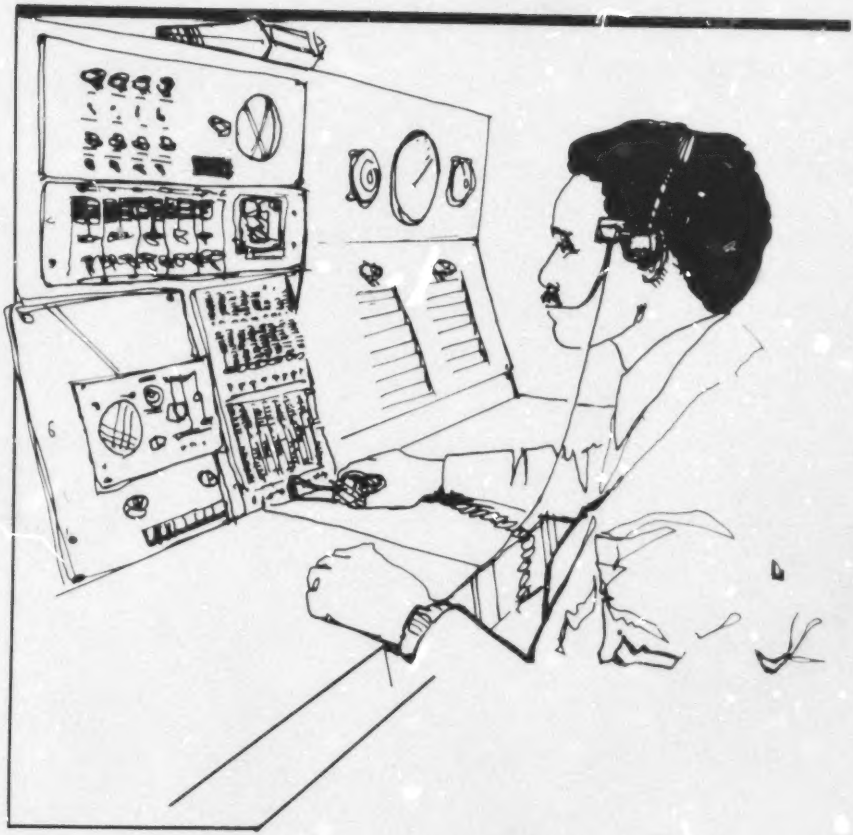
The major responsibilities of the FAA are the development and operation of the National Airspace System. The FAA provides air traffic control services and flight services to both military and civilian aircraft throughout the United States, helps to achieve the efficient use of our airspace, and functions to prevent accidents.

FAA Air Traffic Control Specialists in en route centers monitor and control aircraft flying between airports.

Controllers maintain flight safety and efficiency with sophisticated electronics equipment and procedures. The highly-trained specialists can handle any emergency situation.



Tower, or terminal specialists, control air traffic in and around the Nation's airports.



Flight Service Station specialists assist pilots with weather advisories, flight plan information, and emergency services... The worried voice over the radio, "I'm lost! Can you help me?" is heard often by Flight Service controllers, who are credited with saving lives almost routinely.

II. COMPUTER SPECIALIST

Computers are used extensively to help keep track of aircraft flying in the National Airspace System, to provide flight plan and weather information to monitor aircraft maintenance and operating problems, and in many administrative and management functions.

III. ELECTRONICS TECHNICIAN

Airway Facilities technicians and engineers maintain a complicated array of National Airspace System electronics: radar, communications, computers, navigational aids, and other special purpose equipment, all of which must operate flawlessly to ensure safe flight.

IV. AVIATION SAFETY INSPECTOR

Aviation Safety Inspectors (ASI's) develop, administer, and enforce regulations and standards concerning civil aviation safety. Two major specialty areas under ASI are:

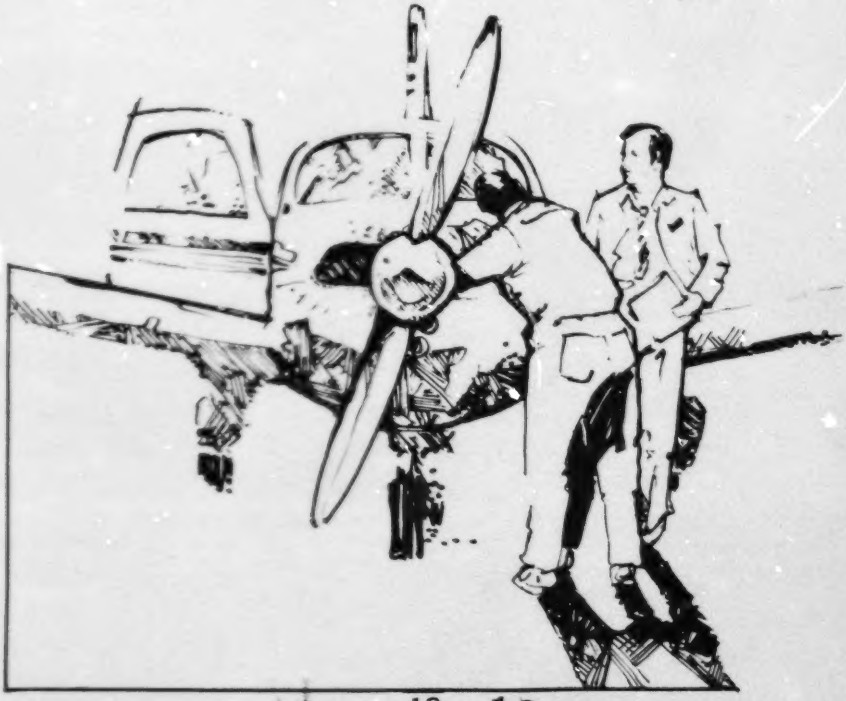
***General Aviation Airworthiness**
***General Aviation Operations**

GENERAL AVIATION AIRWORTHINESS

ASI's in this specialty evaluate mechanics and repair facilities, mechanic training programs, and inspect aircraft for airworthiness.

GENERAL AVIATION OPERATIONS

These ASI's examine pilots for their initial licenses and ratings and for continuing competence, evaluate pilot training programs, and evaluate commercial aviation (other than air carrier) operations.



THE AIRWAY SCIENCE CURRICULUM

The Airway Science curriculum has a nucleus of courses that provides you with a comprehensive educational program emphasizing...

Critical thinking, cognitive and analytical skills, communications skills, plus mathematics, science and technology, computers, management, and aviation.

Subject Areas

General Studies:	
English Composition	(3)
Technical Writing	(3)
Economics	(6)
Government	(3)
Psychology	(3)
Humanities	(3)
History	(3)
Speech	(3)
Total	27
Math/Science/Technology:	
Algebra/Trigonometry	(3)
Calculus	(3)
Physics	(8)
Geography	(4)
Statistics	(3)
Chemistry	(4)
Total	25
Computer Science:	
Introduction to the Computer	(3)
Computer Programming I	(3)
Computer Science Elective	(3)
Total	9
Management:	
Principles of Management	(3)
Organizational Behavior	(3)
Techniques of Supervision	(3)
Total	9
Aviation:	
Introduction to Aeronautics or Private Pilot Certification	(3)
Aviation Legislation	(3)
Flight Safety	(3)
Air Traffic Control	(3)
The National Airspace System	(3)
Total	15
Areas of Concentration: Students will choose one area (see following sample curricula)	(40)
Total	40
Total	125

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CAREER SPECIALIZATION OPTIONS*

There are five Airway Science options in which you can specialize...

A AIRWAY SCIENCE MANAGEMENT...

Will prepare you to pursue a variety of administrative and management positions; career options in the Federal Aviation Administration include...

- **Air Traffic Control Specialist**

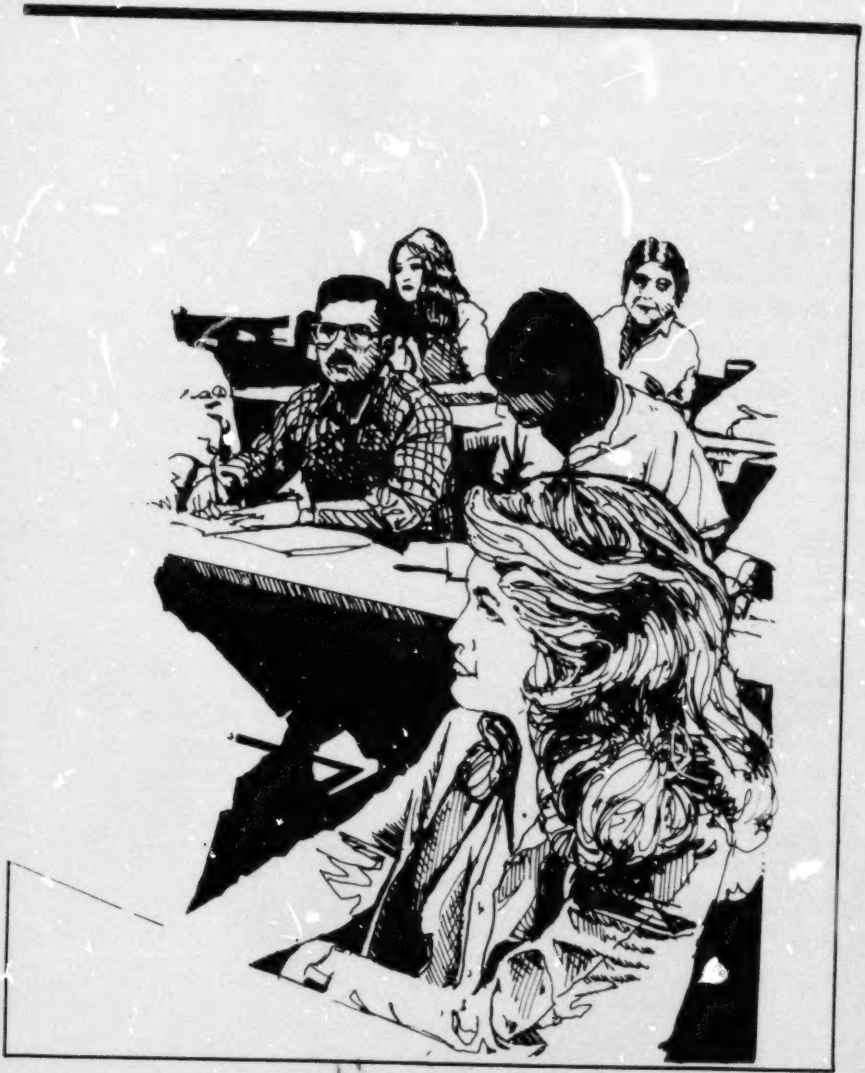
In the non-government sector, with experience, you can qualify for...

- **Air Carrier Manager**
- **Airport Manager**
- **General Aviation Operations Manager**

Area of Concentration/Sample Curriculum

I. Airway Science Management:	
Introduction to Sociology	(3)
Theories of Personality	(3)
Psychology of Communication	(3)
Intro to Interpersonal Communication	(3)
Communication Theory and Models	(3)
Introduction to Administrative Problems	(3)
Air Transportation	(3)
Airport Management	(3)
Theories of Personnel Management	(3)
Concepts of Air Transport Utilization	(3)
Labor/Management Relations	(3)
Operations Management	(2)
Management Decisionmaking	(2)
Approved Electives	(3)
Total	40

*Option availability will vary among participating colleges and universities (see list, page 26).



B AIRWAY COMPUTER SCIENCE. . .

You'll learn to operate, design, troubleshoot, and program computers used in aviation. Your career options will continue to expand with the emerging technology in such areas as. .

Flight
Navigation
Communications
Information Processing

With the FAA or in the non-government sector as a...

Computer Specialist

II. Airway Computer Science:

Computer Programming II	(3)
Advanced Computer Programming	(3)
Computer Operating Systems	(3)
Assembler Language Programming	(3)
Data Structures	(3)
Computer Methods and Applications I	(3)
Computer Methods and Applications II	(3)
Introduction to Microcomputers	(3)
Introduction of Office Automation	(3)
Theory of Programming Languages and Complex Construction	(3)
Mathematical Modeling and Computer Simulation	(4)
Computer Architecture	(3)
Approved Electives	(3)
Total	40

C AIRCRAFT SYSTEMS MANAGEMENT. . .

Concentrates on flying; it's designed to prepare professional pilots with a science and technology background.

You'll learn about aerodynamics, propulsion systems, aircraft structures, and aircraft performance. By the time you graduate, you'll have a Flight Instructor's certificate with airplane, instrument, and multiengine ratings.

You could expect to work for the FAA as an...

Aviation Safety Inspector

Or, in the non-government sector as a...

Professional Pilot
Flight Operations Manager

III. Aircraft Systems Management:

Commercial Pilot Certification	(5)
Instrument Rating	(5)
Multi-engine Rating	(1)
CFI-Airplane	(5)
CFI-Instruments	(3)
Advanced Aerodynamics and Aircraft Performance	(3)
Advanced Aircraft Systems	(3)
Meteorology	(3)
Weather Reporting and Analysis	(3)
Aviation Management	(3)
Air Transportation	(3)
CFI-Multiengine	(3)
Total	40

D AIRWAY ELECTRONIC SYSTEMS. . .

A comprehensive study that combines electronic theories with practical experience. You'll qualify for interesting work with general aviation in electronics...

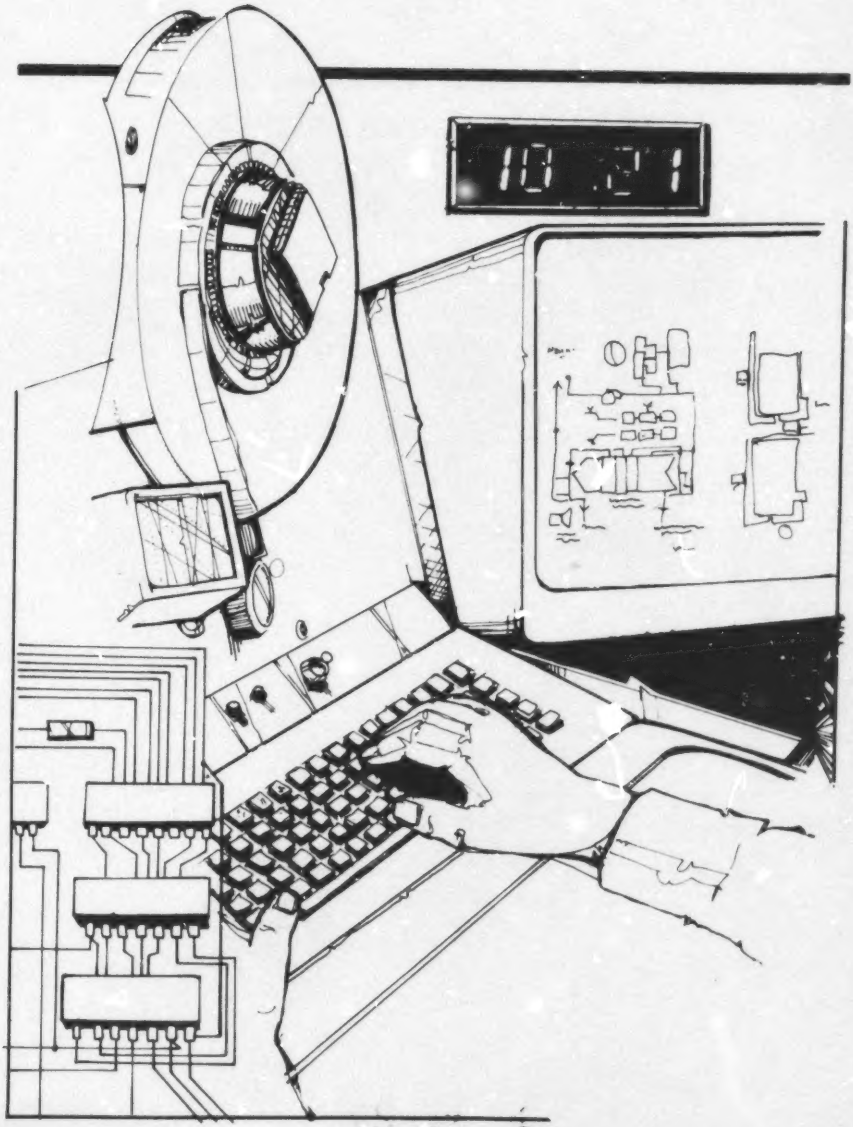
Troubleshooting
Maintenance
Testing
Development

With the FAA or in the non-government sector as an...

Electronics Technician

IV. Airway Electronic Systems:

Theory of Electronics	(3)
Calculus II	(3)
Math Analysis	(3)
Microprocessor Theory and Application	(3)
Advanced Computer Programming	(3)
Solid State Devices	(3)
Integrated Circuits	(3)
Engineering Drawing	(2)
Electrical Circuits	(3)
Digital Logic Application	(3)
Advanced Logic Analysis	(3)
Reliability and Maintainability Theory and Systems Engineering	(3)
Electrical and Power Principles	(2)
Approved Electives	(3)
Total	40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E AVIATION MAINTENANCE MANAGEMENT. . .

In-depth theories and practical aspects of airframe and powerplant maintenance.

You'll graduate with a Mechanic's Certificate with A & P ratings, in addition to your B.S. degree, which will qualify you to work in the non-government sector in...

Maintenance
Troubleshooting

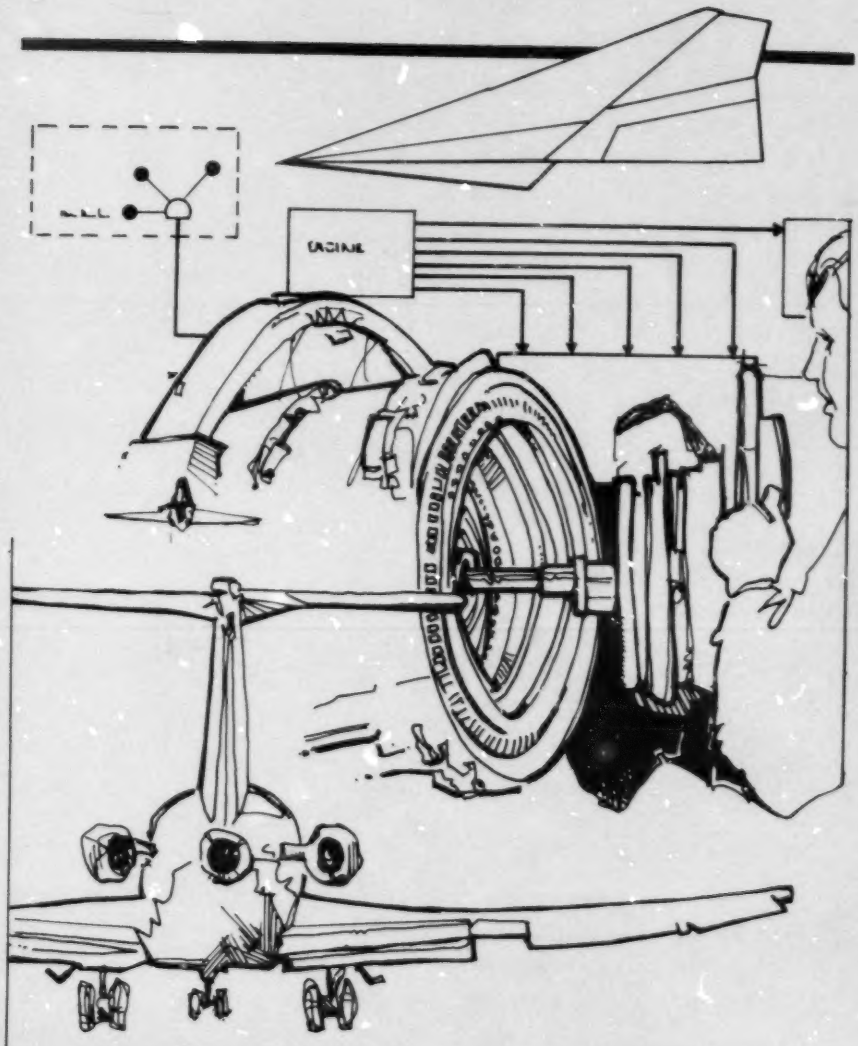
And with the FAA as an...

Aviation Safety Inspector

V. Aviation Maintenance Management:

Engineering Drawing	(2)
Aircraft Materials	(2)
Propulsion	(6)
Propulsion Laboratory	(6)
Structures	(6)
Structures Laboratory	(6)
Aircraft Systems	(3)
Avionics Systems	(3)
Reliability and Maintainability Theory and Systems Engineering	(3)
Approved Electives	(3)
Total	40

These graduates must hold the Airframe and Powerplant Technicians Ratings (Mechanics).



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LIST OF COLLEGES AND UNIVERSITIES PARTICIPATING IN THE AIRWAY SCIENCE CURRICULUM*

	SPECIALTY OPTIONS**
Auburn University Aerospace Engineering Department 162 Wilmore Hall Auburn, Alabama 36849	A, C
Central Missouri State University Department of Power & Transportation Warrensburg, Missouri 64093	C, D, E
Daniel Webster College University Drive Nashua, New Hampshire 03063	A, B, C
Delta State University Commercial Aviation Department Cleveland, Mississippi 38733	A, C
Florida Institute of Technology School of Aeronautics Drawer 1839 Melbourne, Florida 32901	A, B, C
Kearney State College School of Education Kearney, Nebraska 68847	B
Kent State University School of Technology Kent, Ohio 44242	A, B, C, D, E
Metropolitan State College Aerospace Science Department 1006 11th Street Denver, Colorado 80204	C, E

**OPTIONS: A = Airway Science Management
B = Airway Computer Science
C = Aircraft Systems Management
D = Airway Electronic Systems
E = Aviation Maintenance Management

LIST OF COLLEGES AND UNIVERSITIES PARTICIPATING IN THE AIRWAY SCIENCE CURRICULUM*

	SPECIALTY OPTIONS**
Middle Tennessee State University Department of Aerospace Murfreesboro, Tennessee 37132	A, B, C, D, E
National University 4141 Camino del Rio South San Diego, California 92108	A, B, C
University of North Dakota Aerospace Sciences P.O. Box 8193, University Station Grand Forks, North Dakota 58202	A, B,C
The Ohio State University Department of Aviation Box 3022 Columbus, Ohio 43210	A, B, C, D
Oklahoma State University Aviation Education Department Stillwater, Oklahoma 74078	A, B, C
Parks College of St. Louis University Office of the Vice President Cahokia, Illinois 62206	A, C, D, E
Southern Illinois University School of Technical Careers Carbondale, Illinois 62901	A, B, C, D, E

*Additional institutions have been added since publication of this brochure. For an updated listing, contact:

Federal Aviation Administration
Special Examining Division, AAC-80
Mike Monroney Aeronautical Center
Post Office Box 25082
Oklahoma City, OK 73125

AIM HIGH

"Bite off more than you can chew,
Then chew it.
Plan more than you can do,
Then do it.
Point your arrow at a star,
Take your aim, and there you are.

"Arrange more time than you can spare,
Then spare it.
Take on more than you can bear,
Then bear it.
Plan your castle in the air,
Then build a ship to take you there."

...Unknown